

# CLAIMS

I claim:

1. A sample holding card for use with a spectroscopic analytical instrument, said sample holding card comprising a holder adapted to be placed within the instrument, said holder having at least one aperture therein, a sample supporting window mounted to said holder and positioned within said aperture, said sample supporting window comprising a light energy transmitting material formed by one of the steps comprising cleaving, fly cutting, chipping, milling, sawing or scaling.

2. A sample holding card as defined in claim 1 wherein said holder is disposable.

3. A sample holding card as defined in claim 2 wherein said holder is comprised of a cellulose material.

4. A sample holding card as defined in claim 2 wherein said holder comprises a pair of frames, each of said frames having an aperture formed therein and wherein said frames are adapted to be affixed together with said apertures generally in alignment with each other to enable said sample supporting window to be located between said frames.

5. A sample holding card as defined in claim 4 wherein each of said pair of frames is comprised of one half of a common piece of material that is folded over to align the aperture in one of said frames with the aperture in the other of said frames.

6. A sample holding card as defined in claim 4 wherein said frames are affixed together by an adhesive.

7. A sample holding card as defined in claim 6 wherein said adhesive is a pressure sensitive adhesive formed as a layer on at least one of said frames.

8. A sample holding card as defined in claim 1 wherein said holder comprises a pair of frames, each of said frames having an aperture formed therein and wherein said frames are adapted to be affixed together by a magnetic attraction with said apertures generally in alignment with each other to enable said sample supporting window to be located between said frames.

9. A sample holding card as defined in claim 8 wherein one of said frames is comprised of a magnetic material and the other of said frames is comprised of a magnetically attractible material.

10. A sample holding card as defined in claim 2 wherein said sample supporting window is comprised of an alkali halide crystal.

11. A sample holding card as defined in claim 10 wherein said sample supporting window is an alkali halide selected from the group consisting of KBr, NaCl and KCl.

12. A sample holding card as defined in claim 1 wherein said sample supporting window is comprised of a silica material.

13. A sample holding card as defined in claim 1 wherein said sample supporting window is comprised of a glass composition of germanium, arsenic and selenium.

14. A sample holding card as defined in claim 1 wherein said sample supporting window is comprised of a glass composition of germanium, antimony and selenium.

15. A sample holding card as defined in claim 2 further having a cover slide window.

16. A sample holding card as defined in claim 15 wherein a spacer is located between said sample support window and said cover slide window to create a predetermined space therebetween.

17. A sample holding card as defined in claim 15 wherein said cover slide window is affixed to said sample support window by a clamping means.

18. A method for the manufacture of a sample holding card for use in a spectroscopic analytical instrument, said method comprising the steps of:

providing a light transmitting material,

forming a sample supporting window by cleaving, fly cutting, chipping, milling, sawing or scaling material from said light transmitting material to form a sample supporting window that transmits light therethrough,

providing a holder having at least one aperture formed therein, and

mounting the sample supporting window to the holder in a position wherein said sample supporting window extends across said at least one aperture.

19. A method for the manufacture of a sample holding card as defined in claim 14 wherein said step of providing a holder comprises providing a disposable holder.

20. A method for the manufacture of a sample holding card as defined in claim 19 wherein said step of providing a light transmitting material comprises providing an alkali halide crystal.

21. A method for the manufacture of a sample holding card as defined in claim 20 wherein said step of providing a light transmitting material comprises providing an alkali halide crystal selected from the group consisting of KBr, NaCl and KCl.

22. A method for the manufacture of a sample holding card as defined in claim 18 wherein said step of providing a light transmitting material comprises providing a silica based material.

23. A method for the manufacture of a sample card as defined in claim 18 wherein said step of providing a light transmitting material comprises providing a material composed of germanium, arsenic and selenium.

24. A method for the manufacture of a sample holding card as defined in claim 18 wherein said step of providing a light transmitting material comprises providing a material composed of germanium, antimony and selenium.

25. A method for the manufacture of a sample card as defined in claim 19 wherein said step of providing a disposable holder comprises providing a holder comprised of a cellulose material.

26. A method for the manufacture of a sample holding card as defined in claim 25 wherein said step of providing a disposable holder comprises providing a single piece of cellulose material having a central spine and wherein the material is folded in half vertically along the spine to align apertures formed in the each of the folded, mirror image halves.

27. A method for the manufacture of a sample holding card as defined in claim 19 wherein said step of providing a disposable holder comprises providing a holder comprised of two frames that are sealed together, each of the frames having an aperture.

28. A method for the manufacture of a sample holding card as defined in claim 27 further including the step of affixing a cover slide window to the sample holding card to provide a means of sandwiching a sample between said cover slide window and said sample supporting window.

29. A method for the manufacture of a sample card as defined in claim 28 wherein the step of affixing the cover slide window to said sample supporting window comprises using a pressure sensitive adhesive.

30. A method for using a sample holding card in a spectroscopic analytical instrument, said method comprising the steps of:

providing a light transmitting material,

providing a sample supporting window formed by cleaving, fly cutting, chipping, milling, sawing or scaling the window from said light transmitting material,

providing a holder having at least one aperture adapted to fit within the analytical instrument,

mounting the sample supporting window to the holder to position the sample supporting window within the at least one aperture,

placing a sample to be analyzed onto the sample supporting window,

inserting the holder into the analytical instrument to pass a beam of light energy radiation through the sample.

31. A method as defined in claim 30 wherein said step of providing a holder comprises providing a holder made of a disposable material.

32. A method as defined in claim 31 wherein said step of providing a light transmitting material comprises providing an alkali halide crystal material.

33. A method as defined in claim 32 wherein said step of providing a light transmitting material comprises providing a material selected from the group consisting of KBr, NaCl and KCl

34. A method as defined in claim 31 wherein said step of providing a holder comprises providing a holder comprised of a disposable cellulose material.

35. A method as defined in claim 31 wherein said step of providing a holder further comprises the step of affixing a cover slide window to the holder to form a means of sandwiching a sample between said cover slide window and said sample supporting window.

36. A method as defined in claim 35 wherein said step of placing a sample to be analyzed comprises sandwiching the sample between the cover slide window and the sample supporting window.

37. A method as defined in claim 36 wherein said step placing a sample comprises placing a bacterial colony between said cover slide window and said sample supporting window.

38. A method as defined in claim 30 wherein said step of providing a holder comprises providing a holder having two frames wherein one frame is comprised of a magnetic material and the other frame of a magnetically attractible material.

39. A method for using a sample holding card for use in a spectroscopic analytical instrument, said method comprising the steps of:

providing a holder having a plurality of apertures adapted to fit within the analytical instrument,

providing a light transmitting material,

forming a plurality of sample supporting windows by cleaving, fly cutting, chipping, milling, sawing or scaling windows from said light transmitting material,

mounting one of said plurality of sample supporting windows to the holder to position one of said sample supporting windows within each of the apertures,

placing a sample to be analyzed onto at least one of the sample supporting windows,

inserting the holder having the substrate mounted thereto into the analytical instrument to pass a beam of light energy through the sample.

40. A method for using a sample holding card as defined in claim 39 wherein said step of forming a plurality of apertures and sample supporting windows mounted thereon comprises forming the plurality of apertures and sample supporting windows in a carousel configuration.

41. A method for using a sample holding card as defined in claim 40 wherein said step of placing a sample to be analyzed comprises placing a plurality of samples onto said plurality of sample supporting windows and said analytical instrument passes light energy sequentially through said plurality of samples.

42. A method for using a sample holding card as defined in claim 40 wherein said step of placing a sample onto at least one of the sample supporting windows comprises placing a bacterial colony onto said at least one sample supporting window.

43. A method for using a sample holding card as defined in claim 40 wherein said step of inserting the holder having the substrate mounted thereto into the analytical instrument comprises inserting the holder in a horizontal position within the instrument and passing a beam of light energy at least once through the sample.

44. A method for using a sample holding card as defined in claim 43 wherein the beam of energy is passed at least twice through the sample by means of reflection.

45. A method for using a sample holding card for use in a spectroscopic analytical instrument, said method comprising the steps of:

- providing a plurality of holders, each having at least one aperture,
- providing a light transmitting material,
- forming a plurality of sample supporting windows by cleaving, fly cutting, chipping, milling, sawing or scaling windows from said light transmitting material,
- mounting one of said plurality of sample supporting windows to each of said plurality of holders to position one of said sample supporting windows within each of the apertures,
- providing a mechanical carousel adapted to interfit into the analytical instrument,
- mounting said plurality of holders onto the mechanical carousel.
- placing a sample to be analyzed onto at least one of the sample supporting windows,
- inserting the carousel into the analytical instrument to pass a beam of light energy in a sequential manner through the plurality of samples.

46. A method for using a sample holding card in a spectroscopic analytical instrument, said method comprising the steps of:

- providing a light transmitting material,

providing a sample supporting window formed by cleaving, fly cutting, chipping, milling, sawing or scaling the sample supporting window from said light transmitting material,

providing a holder having at least one aperture adapted to fit within the analytical instrument,

mounting the sample supporting window to the holder to position the sample supporting window across the at least one aperture,

inserting the holder into the analytical instrument to pass a beam of light energy through the sample supporting window to obtain one or more background scans of the light supporting window,

placing a sample to be analyzed onto the sample supporting window,

inserting the holder into the analytical instrument to pass a beam of light energy through the sample within the holder, and,

using the one or more background scans to subtract the absorbances of the background sample supporting window from the absorbances of the sample.

47. A method for using a sample holding card in a spectroscopic analytical instrument, said method comprising the steps of:

providing a light transmitting material,

providing a sample supporting window formed by cleaving, fly cutting, chipping, milling, sawing or scaling the sample supporting window from said light transmitting material,

providing a holder having at least one aperture adapted to fit within the analytical instrument,

mounting the sample supporting window to the holder to position the sample supporting window across the at least one aperture,

placing a material onto the sample supporting window with which the sample will be mixed (medium),

inserting the holder into the analytical instrument to pass a beam of light energy through the medium within the holder to obtain one or more background scans of the light supporting window,



placing a sample to be analyzed and the medium onto the sample supporting window,

inserting the holder into the analytical instrument to pass a beam of light energy through the sample supporting window and the medium within the holder, and,

using the one or more background scans to subtract the absorbances of the medium and the sample supporting window from the absorbances of the sample.

48. A method of using a sample holding card as defined in claim 47 wherein said step of placing a material onto the sample supporting window with which the sample will be mixed (medium) comprises placing an alkali halide crystal.

49. A method of using a sample holding card as defined in claim 48 wherein said step of placing a material onto the sample supporting window with which the sample will be mixed (medium) comprises placing KBr.

50. A method of using a sample holding card as defined in claim 47 wherein said step of placing a material onto the sample supporting window with which the sample will be mixed (medium) comprises placing mineral oil.

51. A method of using a sample holding card as defined in claim 47 wherein said step of placing a material onto the sample supporting window with which the sample will be mixed (medium) comprises placing a solvent.